ORDER NO. SD82042179C8

Service Manual

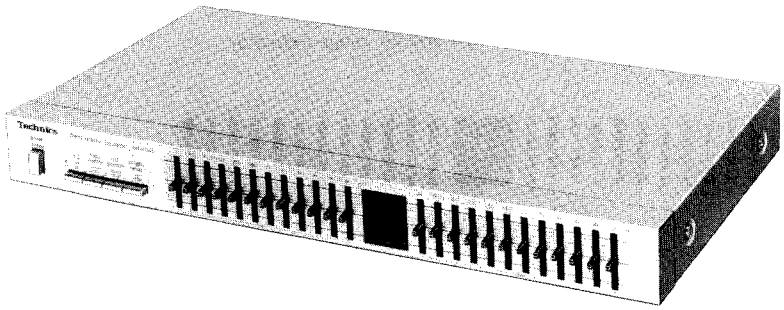
Stereo Graphic Equalizer

SH-8045

[E], [EK], [XA], [XL], [EF], [EB]

SH-8045(K)

[E], [EK], [XA], [XL], [EF], [EB]



Areas

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.
* [EF] is available in France.
* [EB] is available in Belgium.

* The cabinet and front panel are avilable in black color and silver types.
* The black type model is provided with (K) in the Service Manual.

Specifications

(Specifications are subject to change without notice for further improvement.)

(DIN 45 500)

Frequency response (center position)	: 5 Hz~100 kHz, −1 dB
Maximum output voltage	: 8 V (1 kHz, THD 0.01%)
Rated output voltage	: 1 V
Rated total harmonic distortion	: 0.005% (20 Hz~20 kHz) 0.003% (1 kHz)
Input sensitivity	: 1 V
Signal-to-noise ratio	: 100 dB (110 dB, IHF' A)
Maximum input voltage	: 8 V (1 kHz)
Input impedance	: 47 kΩ
Gain	: 0±1 dB
Channel balance 250 Hz~6300 Hz	: ±0.5 dB
Channel separation 1kHz	: 70 dB
Band level controls	: +12 dB~−12 dB, +3 dB~−3 dB (12 elements continuously variable per channel)
Center frequency	: 16 Hz, 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz

GENERAL

Power supply	: AC 110 V/120 V/220 V/240V, 50 Hz/60 Hz. AC 240 V 50 Hz only (For Australia)
Power consumption	: 19 W
Dimensions (H×W×D)	: 53×430×235 mm (2-3/32"×16-29/32"×9-1/4")
Weight	: 2.6 kg (5.7lb)

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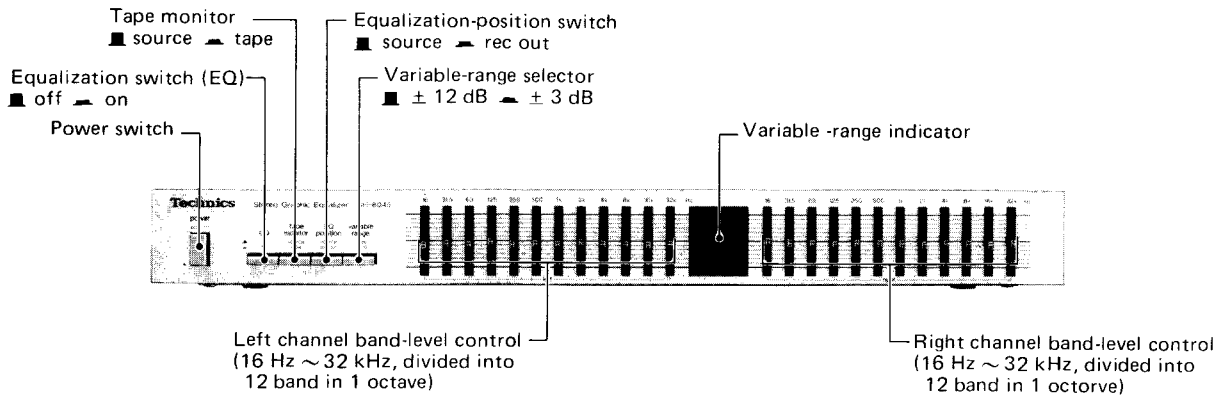
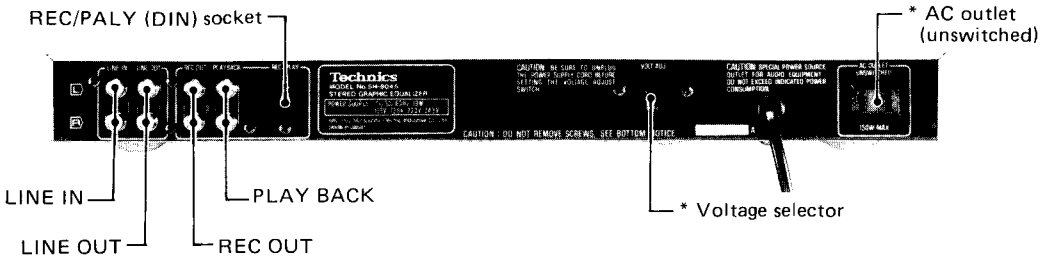
Technics

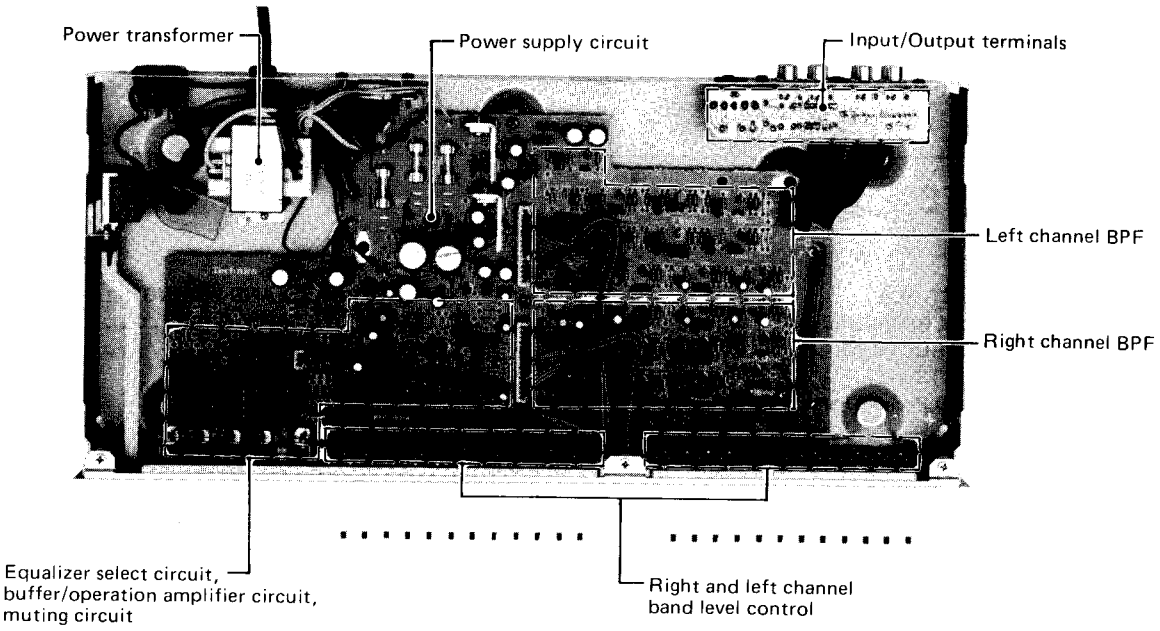
Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

■ LOCATION OF CONTROLS





*** This power supply for this unit varies depending the areas. Also, the parts used for power supply are different. So, refer to the cirucit diagram and replacement part list.**
*** [XA] area is provided with AC outlet.**
*** [XL] area is not provided with voltage selector.**



ORDER NO. SD82042179C8-A

Stereo Graphic Equalizer

SH-8045/SH-8045(K)

This booklet contains the specifications for SH-8045, written in Germany, Franch and Spanish, and the circuits to be changed according to the areas.
File this manual together with the SH-8045 service manual (Order No. SD82042179C8).

DEUTSCH

FRANÇAIS

DEUTSCH

■ TECHNISCHE DATEN (Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

Frequenzgang (mittelstellung)	: 5 Hz~100 kHz, −1 dB
Maximalausgangs-spannung	: 8 V (1 kHz, THD 0,01%)
Nennausgangsspan-nung	: 1 V
Nennklirrfaktor	: 0,005% (20 Hz~20 kHz) 0,003% (1 kHz)
Eingangsspannung	: 1 V
Geräuschabstand	: 100 dB (110 dB, IHF, A)
Maximaleingangs-spannung	: 8 V (1 kHz)
Eingangsimpedanz	: 47 kΩ
Verstärkung	: 0±1 dB
Kanalsy mmetrie 250 Hz~6300 Hz	: ±0,5 dB
Kanaltrennung 1kHz	: 70 dB
Frequenzgangregler	: +12 dB~−12 dB, +3 dB~−3 dB (12 Regler, stufenlos verstellbar)
Mittenfrequenzen	: 16 Hz, 31,5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz

ALLGEMEINE DATEN

Stromversorgung	: Wechselstrom, 110 V/120 V/220 V/240 V, 50 Hz/60 Hz
Leistungsaufnahme	: 19 W
Abmessungen (H×B×T)	: 53×430×235 mm (2-3/32"×16-29/32"×9-1/4")
Gewicht	: 2,6 kg (5,7 lb)

FRANÇAIS

■ CARACTERISTIQUES (Sujet á changement sans préaris.)

(DIN 45 500)

Courbe de réponse (position centrale)	: 5 Hz~100 kHz, −1 dB
Tension de sortie maximale	: 8 V (1 kHz, THD 0,01%)
Tension de sortie nominale	: 1 V
Distortion harmonique totale	: 0,005% (20 Hz~20 kHz) 0,003% (1 kHz)
Sensibilité d'entrée	: 1 V
Signal/Bruit	: 100 dB (110 dB, IHF, A)
Tension d'entrée maximale	: 8 V (1 kHz)
Impédance d'entrée	: 47 kΩ
Gain	: 0±1 dB
Equilibrage de canal 250 Hz~6300 Hz	: ±0,5 dB
Séparation de canal 1 kHz	: 70 dB
Commandes de niveau de gamme	: +12 dB~−12 dB, +3 dB~−3 dB (12 éléments, continuellement variables)
Fréquences charnières	: 16 Hz, 31,5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz

GENERALITES

Alimentation	: CA, 110 V/120 V/220 V/240 V, 50 Hz/60 Hz
Consommation	: 19 W
Dimensions (h×l×pr) mm	: 53×430×235 mm (2-3/32"×16-29/32"×9-1/4")
Poids	: 2,6 kg (5,7 lb)

ESPAÑOL

■ ESPECIFICACIONES (Estas especificaciones están sujetas a cualquier cambio sin previo eviso.)

(DIN 45 500)

Respuesta de frecuencia (posición central)	: 5 Hz ~ 100 kHz, −1 dB
Tensión de salida máxima	: 8 V (1 kHz, THD 0.01%)
Tensión de salida de régimen	: 1 V
Distorsión armónica total nominal :	0.005% (20 Hz ~ 20 kHz) 0.003% (1 kHz)
Sensibilidad de entrada	: 1 V
Relación de señal ruido	: 100 dB (110 dB, IHF' A)
Tensión de entrada máxima	: 8 V (1 kHz)
Impedancia de entrada	: 47 kΩ
Ganancia	: 0 ± 1 dB
Equilibrio de canales 250 Hz ~ 6300 Hz	: ± 0.5 dB
Separación de canales 1 kHz	: 70 dB
Controles de nivel de banda	: + 12 dB ~ − 12 dB, + 3 dB ~ − 3 dB (12 elementos, continuamente variables)
Frecuencia central	: 16 Hz, 31.5 Hz, 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz, 32 kHz

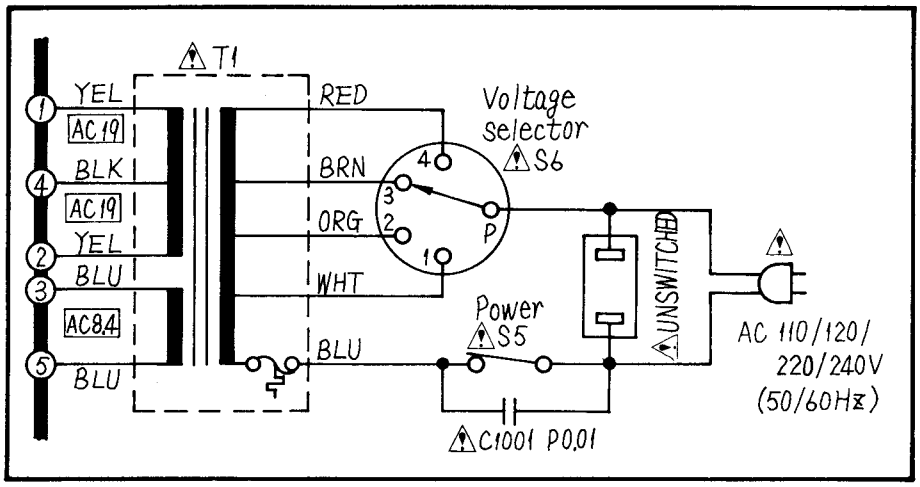
EN GENERAL

Alimentación de corriente	: C.A. de 110 V/120 V/220 V/240 V, 50 Hz/60 Hz
Consumo de corriente	: 19 W
Dimensiones (alto × ancho × prof.)	: 53 × 430 × 235 mm (2-3/32" × 16-29/32" × 9-1/4")
Peso	: 2.6 kg (5.7 lb)

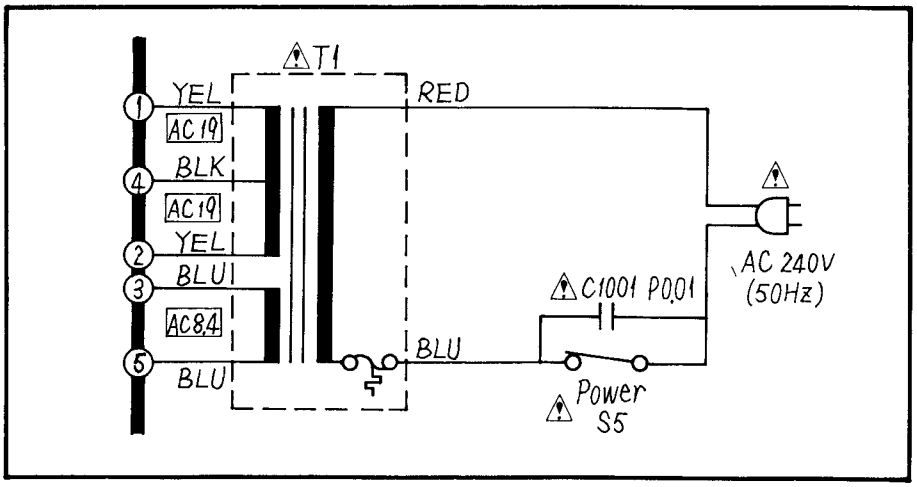
■ CIRCUITS TO BE CHANGED AND THE AREAS

- **Power source circuit**

[XA] area



[XL] area



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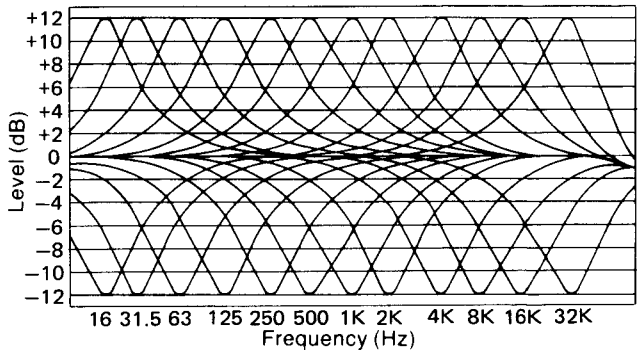
■ TOTAL FREQUENCY RESPONSE

Frequency response (± 12 dB position)



■ DISASSEMBLY INSTRUCTIONS

- **How to remove the front panel**

1. Remove the setscrews ❶ ~ ❹ in **Fig. 1** to remove the cabinet.
2. Remove the 6 setscrews (**Fig. 1 :** ❺ ~ ⓫) of the front panel.
3. Pull the connector out of the main P.C.B.
4. Remove the front panel with care not to damage the knobs.

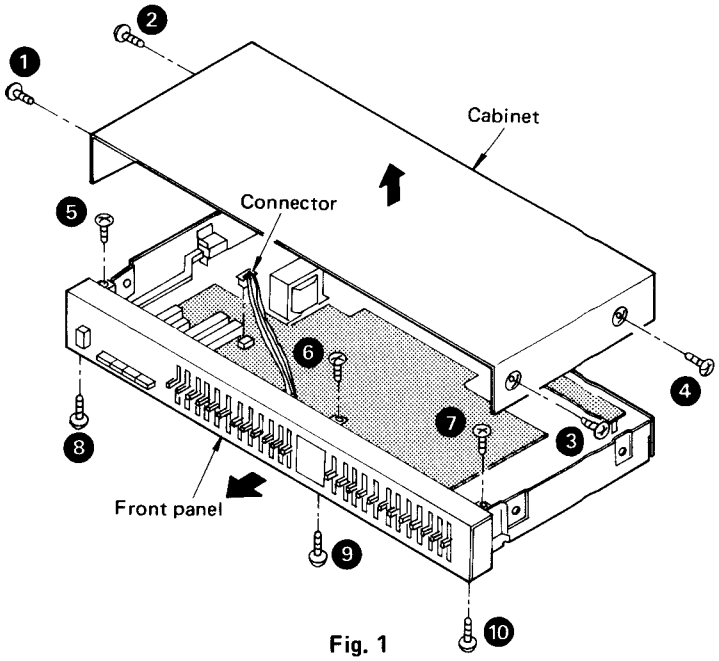


Fig. 1

- **How to remove the P.C.B.**

1. Remove the cabinet and front panel.
2. Remove the power supply knob and 4 setscrews (**Fig. 1 :** ⓫ ~ ⓮) of the front plate.
3. Remove the 5 setscrews (**Fig. 2 :** ⓯ ~ ⓳) of the P.C.B.
4. Remove the front plate from the chassis as in **Fig. 3.**

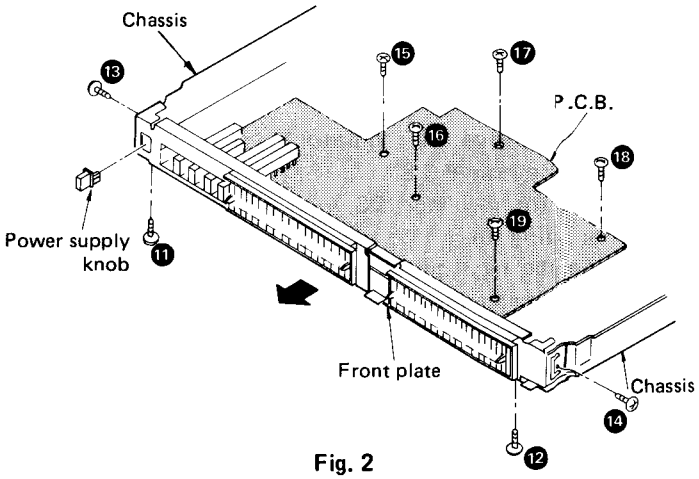


Fig. 2

Push the chassis by hand and pull the front plate toward you while releasing the stopper of front plate.

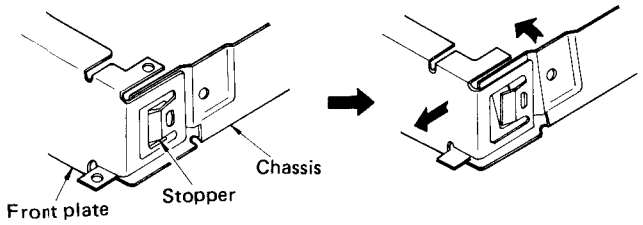


Fig. 3

• How to remove the slide volume

1. Remove the cabinet and front panel.
2. Remove the power supply knob and 4 setscrews (**Fig. 4** : ⓫ ~ ⓮) of the front plate.
3. Pull the 2 connectors out of the main P.C.B.
4. Remove the 2 setscrews (**Fig. 4** : ⓴ , ㉑) of the switch and remove the front plate from the chassis as in **Fig. 3.**
5. Pull out the 12 knobs for the right and left channels, totalling 24 knobs.
6. Remove the ornament panel by pressing the right and left claws (Ⓐ & Ⓑ) from the inside of the chassis as in **Fig. 5.** (There are 2 ornament panel. Remove another panel in the same manner.)
7. Remove the 8 setscrews for the volume and detach the volume along with the P.C.B. from the front plate.

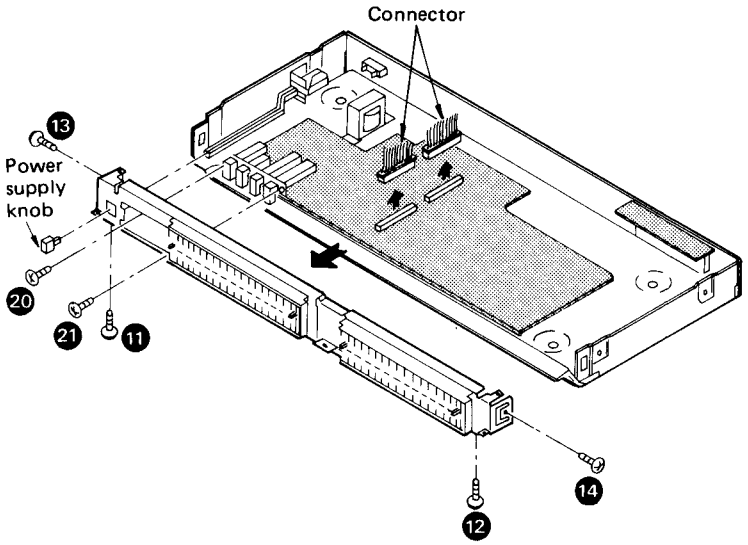


Fig. 4

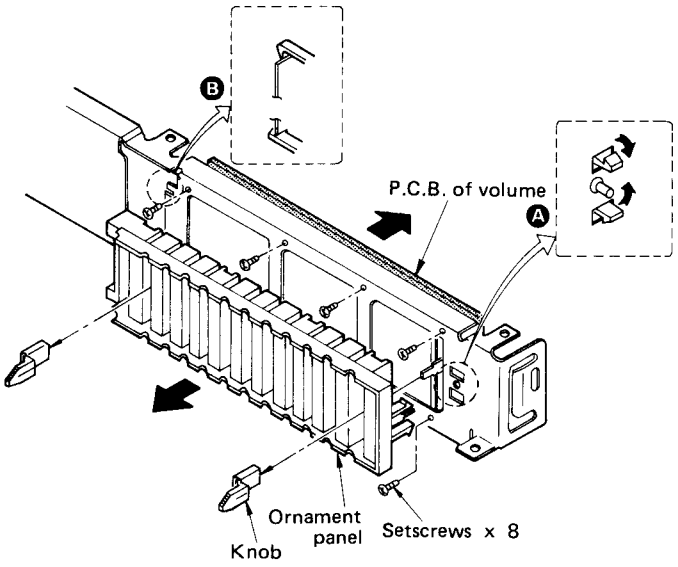


Fig. 5

• How to remove the regulator

1. Remove the main P.C.B.
2. Unsolder the regulator (Q3, 4) at 3 portions and the radiation plate at 1 portion. **(Fig. 6)**
3. Remove the regulator along with the readiation plate, and the setscrews.
4. When soldering the regulator, apply silicone compound (or equivalent heat diffusing agent) to the back of regulator.

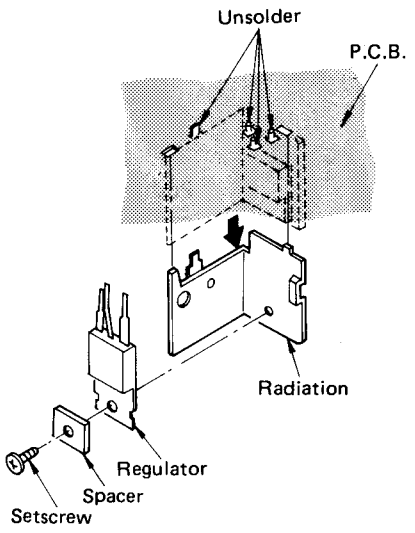


Fig. 6

■ REPLACEMENT PARTS LIST.....Cabinet, Chassis and Packing Parts

Notes:

1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components indentified by ⚠ make have special characteristics importanf for safety. When replacing any of these components, use only manufacturer's specified parts.
3. Bracketed indications Ref. No. columns specify the area.
   Parts without these indications can be used for all areas.
4. The "**S**" mark is service standard parts and may differ from production parts.
5. Ⓚ -marked parts are used for black type only, while ○-marked parts are for silver type only.
6. Parts other than Ⓚ and ○-marked are used for both black and silver types.
7. The parenthesized numbers in the columns of description stand for the quantity per set.

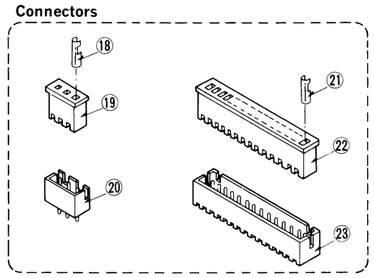
Black type model No. : SH-8045 (K)

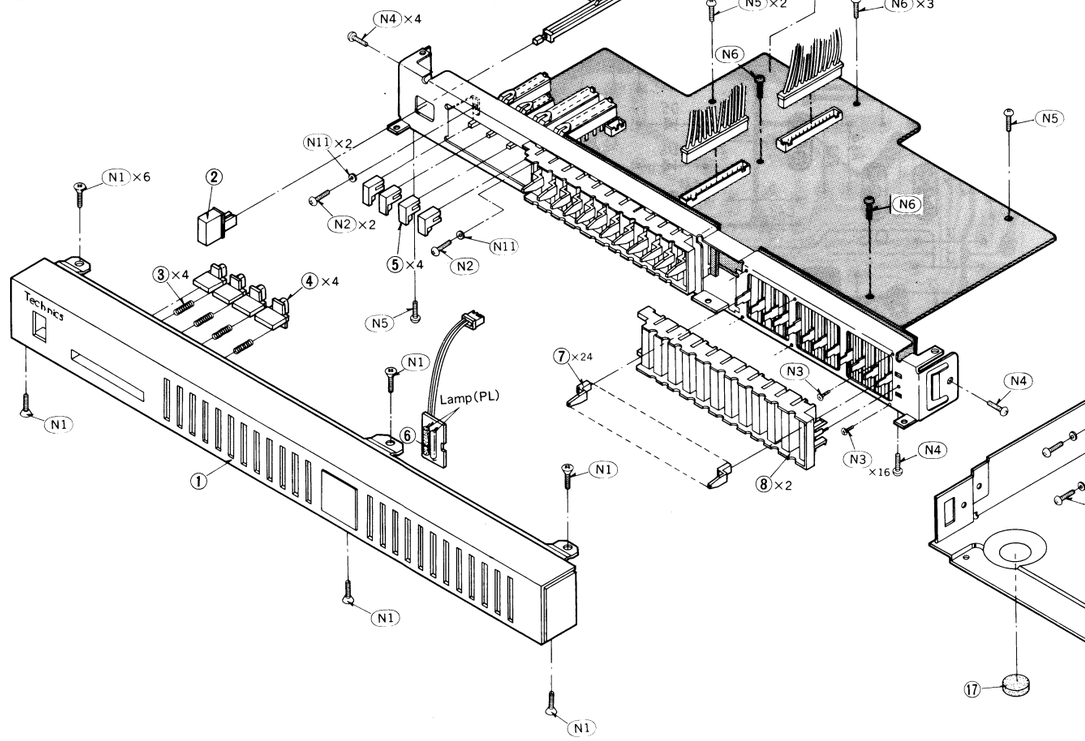
Areas

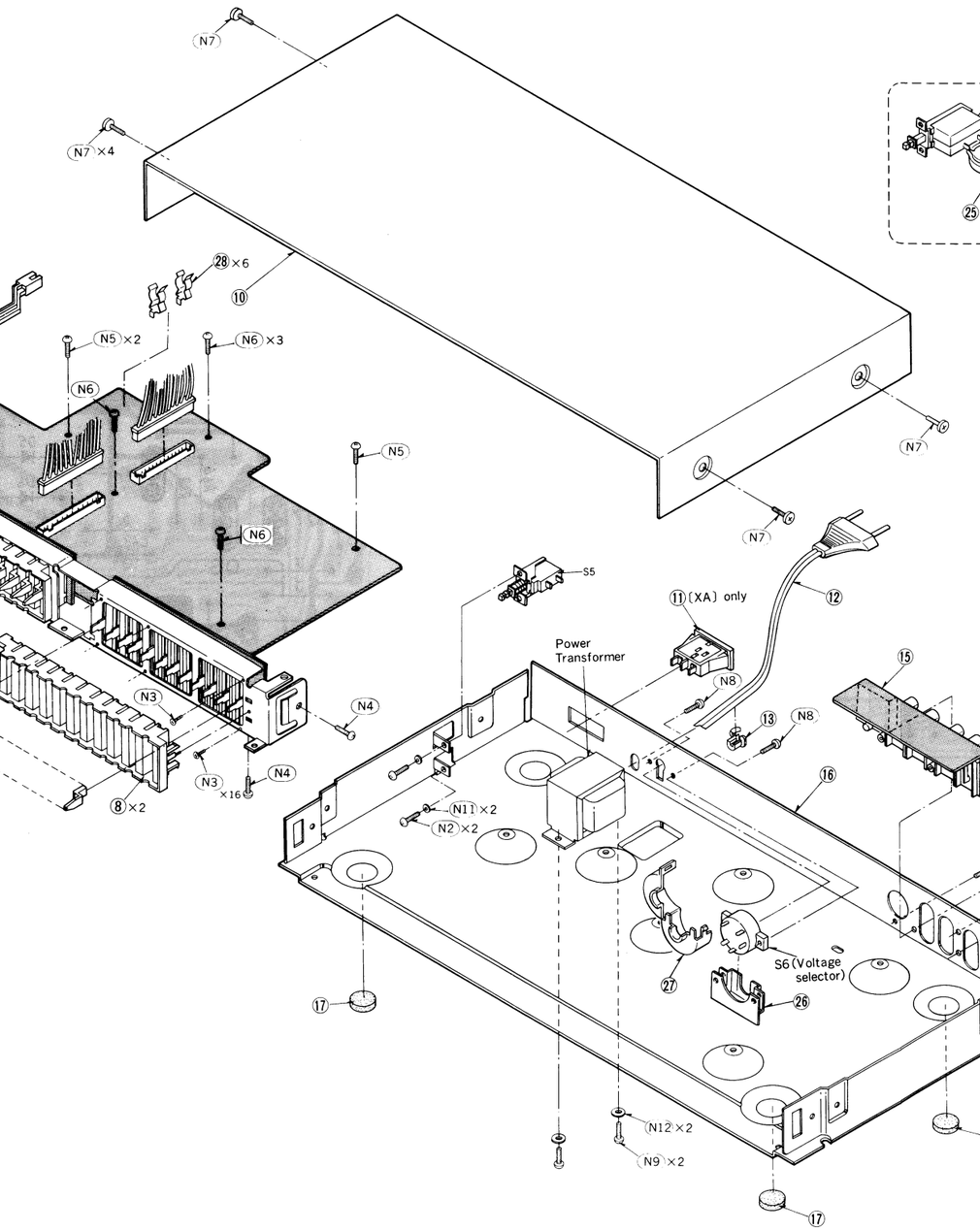
* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.
* [EF] is available in France.
* [EB] is available in Belgium.

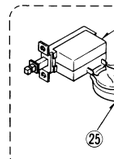
Ref. No.		Part No.	Description	
CABINET and CHASSIS PARTS				
1	○	SGWH8045N	Front Panel Ass'y (Silver)	(1)
1	Ⓚ	SGWH8045KN	Front Panel Ass'y (Black)	(1)
2		SBC337–1	Button, Power Source	(1)
3		SUS159	Spring, Push Switch	(4)
4		SBC413	Button, Push Switch	(4)
5		SUBK7	Coupling Rod Push Switch	(4)
6		SDUK4	Tube, Lamp	(1)
7		SBCK32	Knob, Band Level Control	(24)
8		SGXK43	Ornament, Slide Volume	(2)
9		SUBK6	Coupling Rod, Power Switch	(1)
10	○	SKCH8045N	Cabinet (Silver)	(1)
10	Ⓚ	SKCH8045KN	Cabinet (Black)	(1)
11 [XA] only		SJS9221–1	Socket, AC Outlet	(1)
12	⚠**S**	SJA88	AC Cord	(1)
12 [EK]	⚠	RJA45YA	AC Cord	(1)
12 [XL]	⚠**S**	QFC1208M	AC Cord	(1)
13		SHR127	Bushing, AC Cord	(1)
13 [EK] only		SHR129	Bushing, AC Cord	(1)
14		SJF3431–4N	Terminal, Input & Output	(2)
15		SJS6513	Terminal, REC/PLAY (DIN)	(1)
16		SGPKH8045E	Bottom Board, W/Feet	(1)
16 [XA] only		SGPKH8045x	Bottom Board, W/Feet	(1)
16 [XL] only		SGPKH8045L	Bottom Board, W/Feet	(1)
17		SKL245–2	Foot, Set	(4)
18		SJT783	Terminal, Socket	(3)
19		SJS5331	Socket (3 Pin)	(1)
20		SJT3319	Connector (3 Pin)	(1)
21		SJT783	Terminal, Socket	(30)
22		SJS5047	Socket (15 Pin)	(2)
23		SJT3027	Connector (15 Pin)	(2)
24		SHR301	Clamper, Lead Wire	(5)
25 [E,XA]		SAMA65	Cover, Capacitor	(1)
25 [EK,XL, EB,EF]		SMXK26	Cover, Capacitor	(1)
26 Except for [XL]		SMN1635	Bracket, Voltage Selector Switch	(1)
27 Except for [XL]		SUV473	Cover, Voltage Selector Switch	(1)
28		SJT347	Fuse Clip	(6)
SCREWS				
N1	○ **S**	XTS3+6B	Tapping, ⊕ 3 x 6 (Silver)	(6)
N1	Ⓚ	XTS3+6BFZ	Tapping, ⊕ 3 x 6 (Black)	(6)
N2	**S**	XSN3+6S	⊕ 3 x 6	(4)
N3	**S**	XSN2+4BV	⊕ 2 x 4	(12)
N4	**S**	XTB3+10BFZ	Tapping, ⊕ 3 x 10	(9)
N5		XTBS3+8BFZ1	Tapping, ⊕ 3 x 8	(2)
N6	**S**	XTB3+10BFN	Tapping, ⊕ 3 x 10	(3)
N7	○ **S**	XTB4+8BFN	Tapping, ⊕ 4 x 8 (Silver)	(4)
N7	Ⓚ **S**	XTB4+8BFZ	Tapping, ⊕ 4 x 8 (Black)	(4)
N8	**S**	XTB3+16BFZ	Tapping, ⊕ 3 x 16	(2)
N9	**S**	XTNB+10B	Tapping, ⊕ 3 x 10	(2)
WASHERS				
N11	**S**	XWA3B	Spring, ϕ3	(4)
N12	**S**	XWG3	Plain, ϕ3	(2)
PACKING PARTS				
P1		SPGK90	Carton Box	(1)
P1 [EF] only		SPGK89	Carton Box	(1)
P2	Ⓚ	SGK1413	Label, (Black type only)	(2)
P3		SPSK38	Pad, Right	(1)
P3		SPSK39	Pad, Left	(1)
P5	○	SPP697	Polyethylene Bag, (Silver)	(1)
P5	Ⓚ	SPP647	Polyethylene Bag, (Black)	(1)
ACCESSORIES				
A1 [E,EK, EF,EB]		SQFK10011	Instructions Book	(1)
A1 [XA, XL]		SQFK10018	Instructions Book	(1)
A2		SJP2129–5	Pin Cord	(2)
A3 [XA] only		SJP5213–1	Plug, Power Source	(1)

■ EXPLODED VIEW

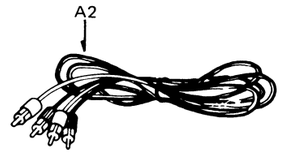


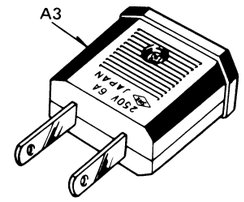






• Accessories





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IEW

• Accessories

Areas

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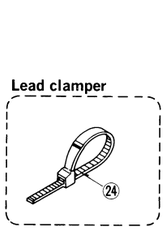

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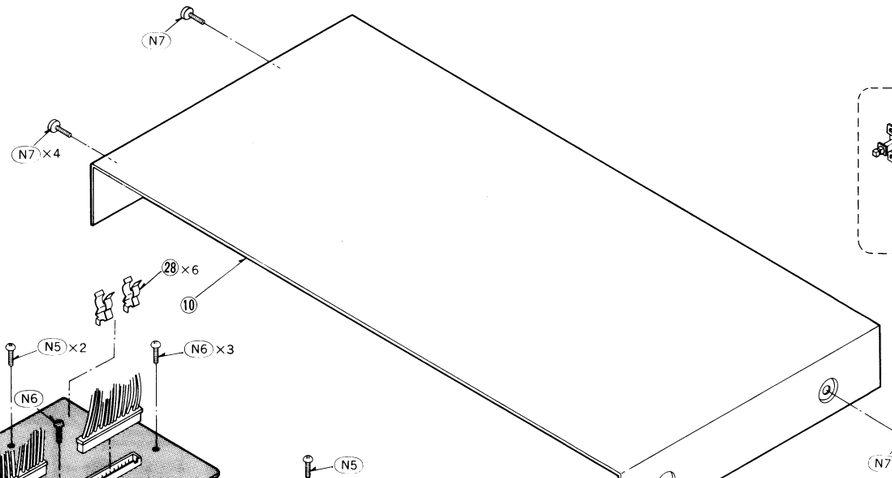

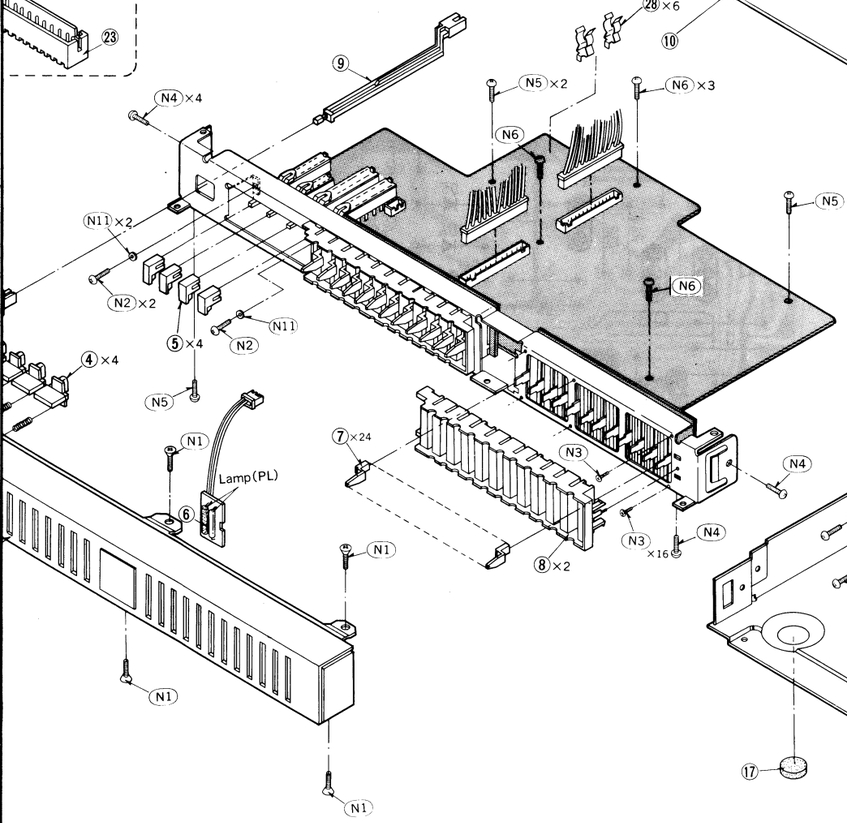

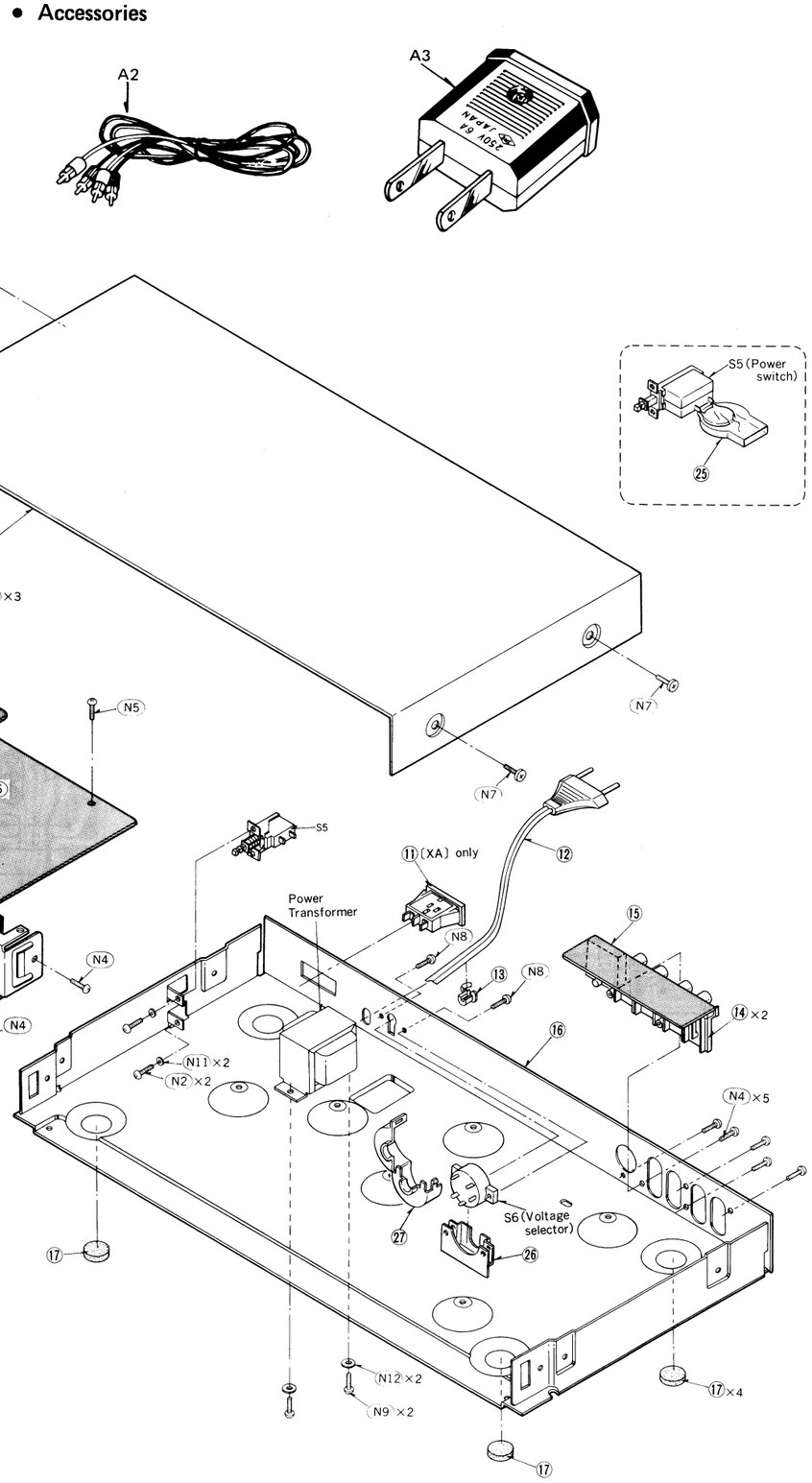

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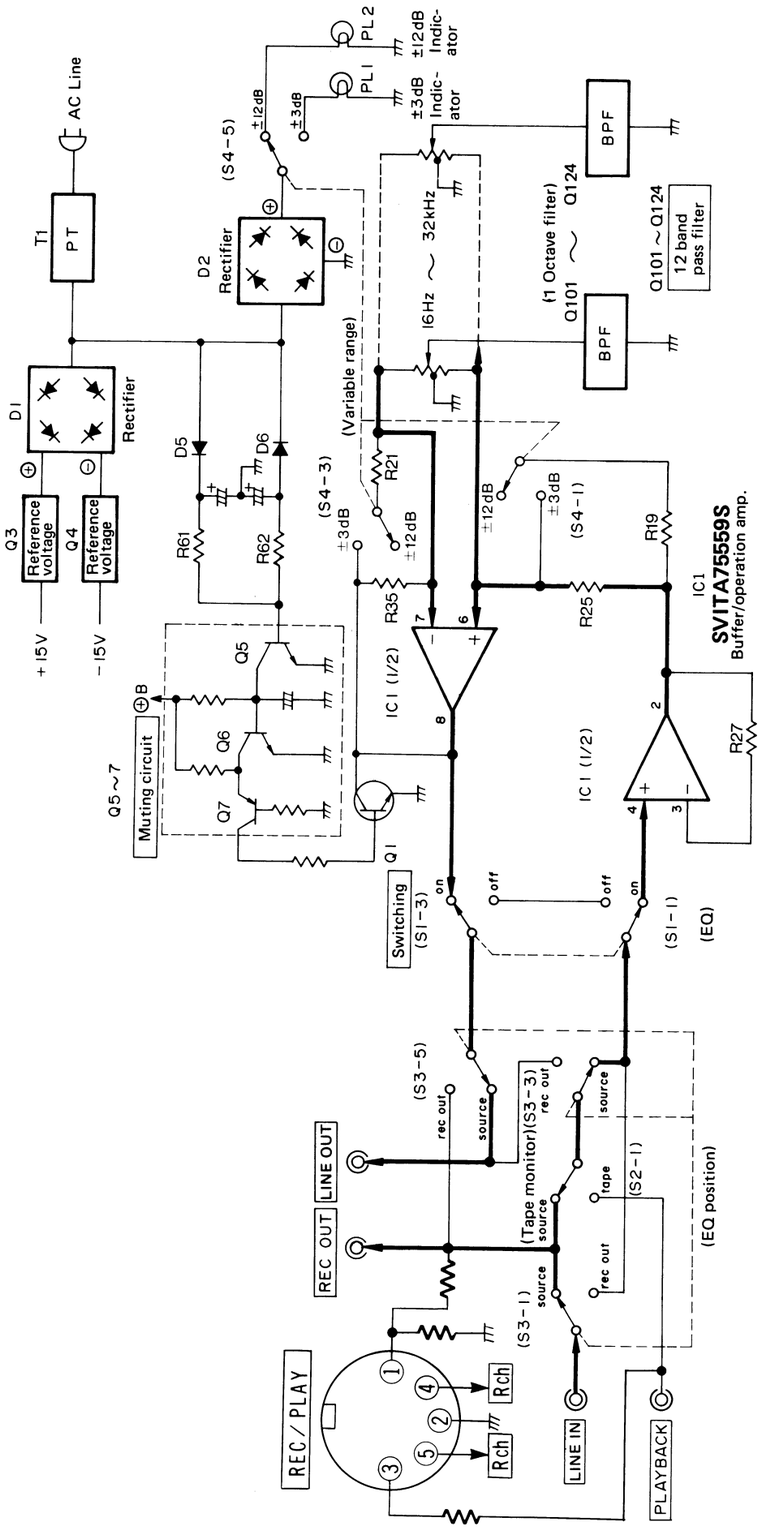
6

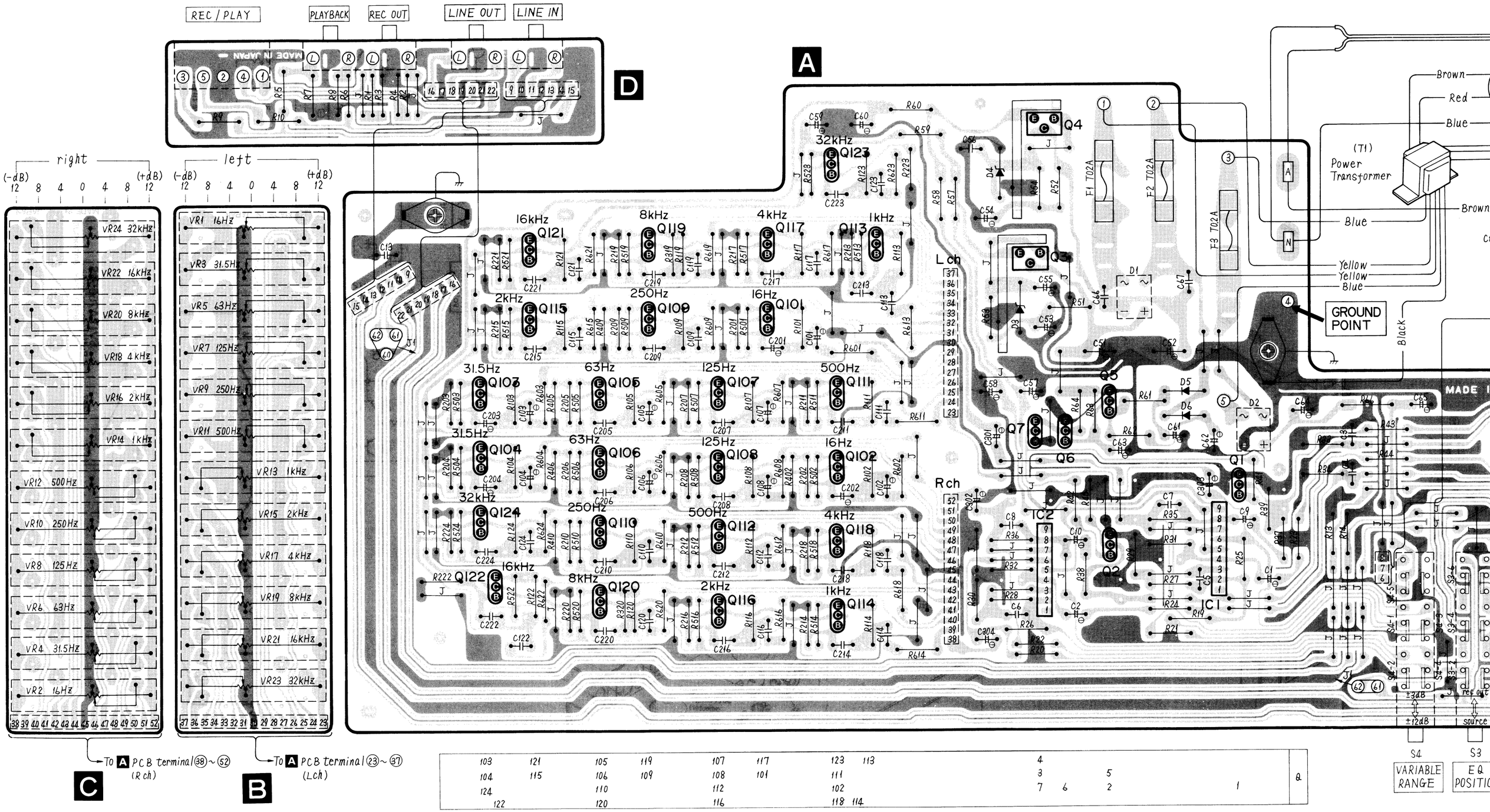
■ BLOCK DIAGRAM



7

■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

Ground (Earth) lines

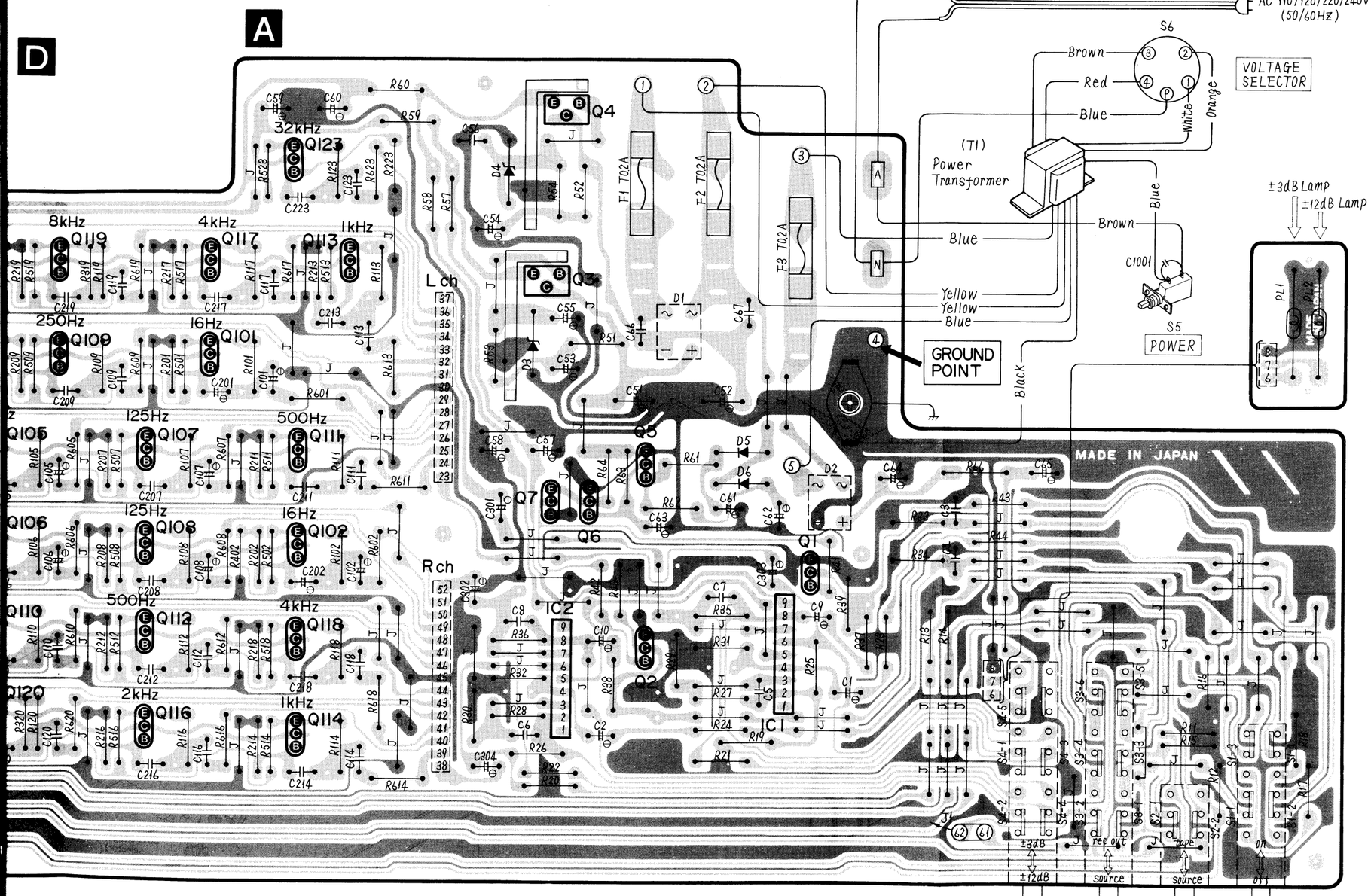


103	121	105	119	107	117	123	113
104	115	106	109	108	101	111	
124		110		112		102	
122		120		116		118	114

4				
3		5		
7	6	2		1

8

Ground (Earth) lines



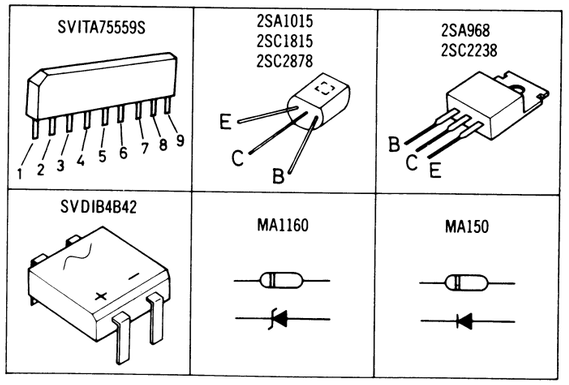
119	107	117	123	113	4					Q
109	108	101	111		3		5			
	112		102		7	6	2		1	
	116		118	114						

Notes:

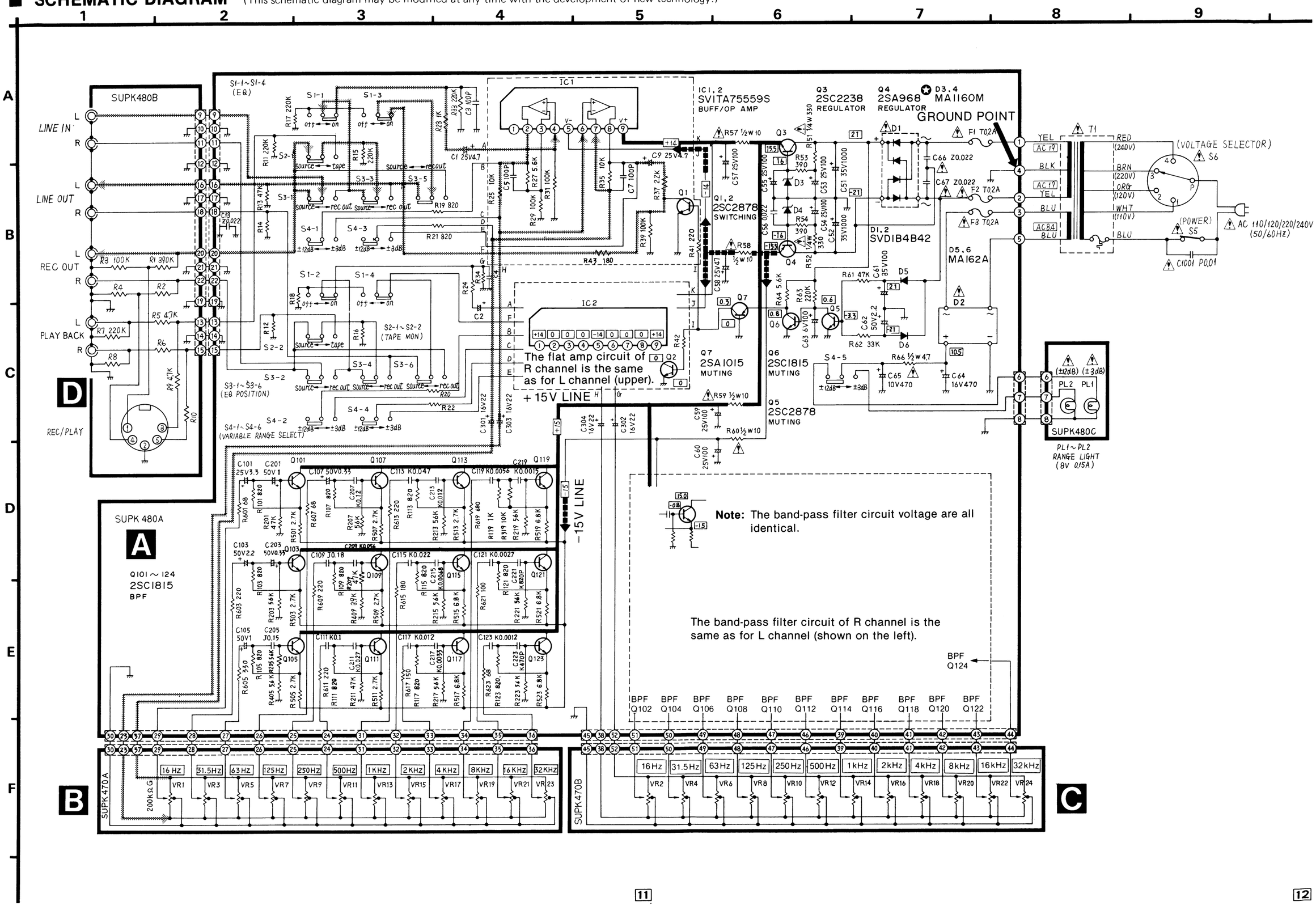
* The part No. of transistors, IC and diodes mentioned in schematic diagram stand for production Part No.
Regarding the Part No. without ✪ mark, the production Part No. are different from the replacement part No.
Therefore, when placing an order for replacement parts, please use the Part No. in the replacement part list.

1. This is the basic circuit diagram (For continental Europe) of this unit.
   Note that part of the circuit is subject to change depending on the areas.
2. Regarding the circuits to be changed in the basic circuit diagram (For continental Europe) and related areas [XL] and [XA], refer to the speparated service manual (Order No. SD82042179C8-A).
3. **S1-1 ~ S1-4** : Equalization (EQ) switch in "**on**" position.
4. **S2-1, S2-2** : Tape monitor switch in "**source**" position.
   source ⇄ tape
5. **S3-1 ~ S3-6** : Equalization position (EQ position) switch in "**source**" position.
   source ⇄ rec out
6. **S4-1 ~ S4-6** : Variable range switch in "**± 12 dB**" position.
   ± 12 dB ⇄ ± 3 dB
7. **S5** : Power switch in "**on**" position.
8. **S6** : Voltage selector switch in "**220V**" position.
   110V ⇄ 120V ⇄ 220V ⇄ 240V
9. The R and L channels use the same circuit.
   For the resistance and capacity of the R channel operation amp. (IC2), refer to the L channel (IC1). The R channel of B.P.F. circuit is omitted.
10. ▭ Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
11. ▨ Signal lines of left channel.
12. ▬ Positive (+ B) voltage lines. ▬▬▶ Negative (– B) voltage lines.
13. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety.
    When replacing any of these components, use only manufacturer's specified parts.

- **Terminal guide of transistors, IC's and diodes**



■ SCHEMATIC DIAGRAM (This schematic diagram may be modified at any time with the development of new technology.)


SUPK480B
LINE IN
LINE OUT
REC OUT
PLAY BACK
REC/PLAY
S1-1~S1-4 (EQ)
S2-1~S2-2 (TAPE MON)
S3-1~S3-6 (EQ POSITION)
S4-1~S4-6 (VARIABLE RANGE SELECT)
IC1
IC1,2 SVITA75559S BUFF/OP AMP
Q1,2 2SC2878 SWITCHING
Q3 2SC2238 REGULATOR
Q4 2SA968 REGULATOR
D3,4 MA1160M
D1,2 SVDIB4B42
D5,6 MA162A
GROUND POINT
T1
(VOLTAGE SELECTOR) S6
(POWER) S5
AC 110/120/220/240V (50/60Hz)
IC2
The flat amp circuit of R channel is the same as for L channel (upper).
+15V LINE
-15V LINE
Q7 2SA1015 MUTING
Q6 2SC1815 MUTING
Q5 2SC2878 MUTING
SUPK480C
PL1~PL2 RANGE LIGHT (8V 0.15A)
SUPK 480A
Q101~124 2SC1815 BPF
Note: The band-pass filter circuit voltage are all identical.
The band-pass filter circuit of R channel is the same as for L channel (shown on the left).
BPF Q124
BPF Q102 BPF Q104 BPF Q106 BPF Q108 BPF Q110 BPF Q112 BPF Q114 BPF Q116 BPF Q118 BPF Q120 BPF Q122
SUPK 470A
SUPK 470B
16 Hz 31.5Hz 63Hz 125Hz 250Hz 500Hz 1KHz 2KHz 4KHz 8KHz 16KHz 32KHz
VR1 VR3 VR5 VR7 VR9 VR11 VR13 VR15 VR17 VR19 VR21 VR23
VR2 VR4 VR6 VR8 VR10 VR12 VR14 VR16 VR18 VR20 VR22 VR24
200KΩG

■ REPLACEMENT PARTS LIST...Electric Parts

Notes:

1. Part numbers are indicated on most mechanical parts. Please this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The " **S** " mark is service standard parts and may differ from production parts.

Areas

* [E] is available in Switzerland and Scandinavia.
* [EK] is available in United Kingdom.
* [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
* [XL] is available in Australia.
* [EF] is available in France.
* [EB] is available in Belgium.

Ref. No.		Part No.	Description
INTEGRATED CIRCUITS			
IC1, 2		SVITA75559S	Operation Amplifier
TRANSISTORS			
Q1, 2, 5		2SC2878A–T	Switching
Q3		2SC2238–OLB	Regulator, ⊕ B Voltage
Q4		2SA968–OLB	Regulator, ⊖ B Voltage
Q6		2SC1815L–G	Muting Circuit
Q7		2SA1015L–G	Muting Circuit
Q101 ~ 124		2SC1815L–G	Band Pass Filter
DIODES			
D1, 2	⚠	SVD1B4B42	Rectifier
D3, 4	S	SVDRD16EB	Zener, 16V
D5, 6	S	MA162A	Switching
VARIABLE RESISTORS			
VR1 ~ 24		EVACH1C10G25	Band Level Control, 200kΩ (G)

Ref. No.		Part No.	Description
TRANSFORMER			
T1	⚠	SLTK5J5–W	Power Source
T1 [XL] only	⚠	SLTK5J10–W	Power Source
LAMP			
PL1, 2	⚠	XAMR81S10	Range Indicator, 8V, 0.15A
SWITCHES			
S1 ~ 4		SSHK21	EQ, Tape Monitor, EQ Position, Variable Range
S5	⚠	ESB90619S	Power Source
S6 Except for [XL]	⚠	ESE3787	Voltage Selector
FUSE			
F1 ~ 3	⚠	XBA2C02TR0	250V, T0.2A

Ref. No.		Part No.	Value
RESISTORS			
R1, 2	S	ERD25TJ394	390K
R3, 4	S	ERD25TJ104	100K
R5, 6	S	ERD25FJ472	4.7K
R7, 8	S	ERD25TJ224	220K
R9, 10	S	ERD25FJ472	4.7K
R11, 12	S	ERD25TJ224	220K
R13, 14	S	ERD25TJ473	47K
R15, 16	S	ERD25TJ224	220K
R17, 18	S	ERD25TJ224	220K
R19, 20	S	ERD25FJ821	820
R21, 22	S	ERD25FJ821	820
R23, 24	S	ERD25FJ102	1K
R25, 26	S	ERD25FJ103	10K
R27, 28	S	ERD25FJ562	5.6K
R29, 30	S	ERD25TJ104	100K
R31, 32	S	ERD25TJ104	100K
R33, 34	S	ERD25TJ224	220K
R35, 36	S	ERD25FJ103	10K
R37, 38	S	ERD25FJ222	2.2K
R39, 40	S	ERD25TJ104	100K

Ref. No.		Part No.	Value
R41, 42	S	ERD25FJ221	220
R43, 44	S	ERD25FJ181	180
R51, 52	⚠ S	ERD25FJ331	330
R53, 54	S	ERD25FJ391	390
R57, 58	⚠ S	ERD50FJ100	10
R59, 60	⚠ S	ERD50FJ100	10
R61	S	ERD25TJ473	47K
R62	S	ERD25TJ333	33K
R63	S	ERD25TJ224	220K
R64	S	ERD25FJ562	5.6K
R66	⚠ S	ERQ12HJ4R7	4.7
R101, 102	S	ERD25FJ821	820
R103, 104	S	ERD25FJ821	820
R105, 106	S	ERD25FJ821	820
R107, 108	S	ERD25FJ821	820
R109, 110	S	ERD25FJ821	820
R111, 112	S	ERD25FJ821	820
R113, 114	S	ERD25FJ821	820
R115, 116	S	ERD25FJ821	820
R117, 118	S	ERD25FJ821	820
R119, 120	S	ERD25FJ102	1K

Ref. No.		Part No.	Value
R121, 122	S	ERD25FJ821	820
R123, 124	S	ERD25FJ821	820
R201, 202	S	ERD25TJ473	47K
R203, 204	S	ERD25TJ563	56K
R205, 206	S	ERD25TJ563	56K
R207, 208	S	ERD25TJ563	56K
R209, 210	S	ERD25TJ473	47K
R211, 212	S	ERD25TJ473	47K
R213, 214	S	ERD25TJ563	56K
R215, 216	S	ERD25TJ563	56K
R217, 218	S	ERD25TJ563	56K
R219, 220	S	ERD25TJ563	56K
R221, 222	S	ERD25TJ563	56K
R223, 224	S	ERD25TJ563	56K
R319, 320	S	ERD25FJ103	10K
R405, 406	S	ERD25FJ562	5.6K
R409, 410	S	ERD25FJ392	3.9K
R501, 502	S	ERD25FJ272	2.7K
R503, 504	S	ERD25FJ272	2.7K
R505, 506	S	ERD25FJ272	2.7K
R507, 508	S	ERD25FJ272	2.7K

Ref. No.		Part No.	Value
R509, 510	S	ERD25FJ272	2.7K
R511, 512	S	ERD25FJ272	2.7K
R513, 514	S	ERD25FJ272	2.7K
R515, 516	S	ERD25FJ682	6.8K
R517, 518	S	ERD25FJ682	6.8K
R519, 520	S	ERD25FJ682	6.8K
R521, 522	S	ERD25FJ682	6.8K
R523, 524	S	ERD25FJ682	6.8K
R601, 602	S	ERD25FJ680	68
R603, 604	S	ERD25FJ221	220
R605, 606	S	ERD25FJ331	330
R607, 608	S	ERD25FJ680	68
R609, 610	S	ERD25FJ221	220
R611, 612	S	ERD25FJ221	220
R613, 614	S	ERD25FJ221	220
R615, 616	S	ERD25FJ181	180
R617, 618	S	ERD25FJ151	150
R619, 620	S	ERD25FJ680	68
R621, 622	S	ERD25FJ101	100
R623, 624	S	ERD25FJ680	68

Ref. No.		Part No.	Value
CAPACITORS			
C1, 2	S	ECEA25Z4R7	4.7
C3, 4	S	ECCD1H101K	100P
C5, 6	S	ECCD1H101K	100P
C7, 8	S	ECCD1H101K	100P
C9, 10	S	ECEA25Z4R7	4.7
C13	S	ECKD1H223ZF	0.022
C51, 52	S	ECEA1VS102	1000
C53, 54	S	ECEA1ES101	100
C55,	S	ECEA1ES101	100
C56	S	ECKD1H223ZF	0.022
C57	S	ECEA1ES101	100

Ref. No.		Part No.	Value
C58	S	ECEA1ES470	47
C59, 60	S	ECEA1ES101	100
C61	S	ECEA1VS101	100
C62	S	ECEA50Z2R2	2.2
C63	S	ECEA1AS101	100
C64	S	ECEA1CS471	470
C65	S	ECEA1AS471	470
C66, 67	⚠ S	ECKD1H223ZF	0.022
C101, 102	S	ECEA50Z3R3	3.3
C103, 104	S	ECEA50Z2R2	2.2
C105, 106	S	ECEA50Z1	1
C107, 108	S	ECEA50ZR33	0.33

Ref. No.		Part No.	Value
C109, 110		ECQM1H184JZ	0.18
C111, 112	S	ECQM1H104JZ	0.1
C113, 114	S	ECQM1H473JZ	0.047
C115, 116	S	ECQM1H223JZ	0.022
C117, 118	S	ECQM1H123JZ	0.012
C119, 120	S	ECQM1H562JZ	0.0056
C121, 122	S	ECQM1H272JZ	0.0027
C123, 124	S	ECQM1H122JZ	0.0012
C201, 202	S	ECEA50Z1	1
C203, 204	S	ECEA50ZR33	0.33
C205, 206		ECQV05154JZ	0.15
C207, 208	S	ECQM1H124JZ	0.12

Ref. No.		Part No.	Value
C209, 210	S	ECQM1H563JZ	0.056
C211, 212	S	ECQM1H273JZ	0.027
C213, 214	S	ECQM1H123JZ	0.012
C215, 216	S	ECQM1H682JZ	0.0068
C217, 218	S	ECQM1H332JZ	0.0033
C219, 220	S	ECQM1H152JZ	0.0015
C221, 222	S	ECKD1H821KB	820P
C223, 224	S	ECKD1H471KB	470P
C301, 302	S	ECEA1ES220	22
C303, 304	S	ECEA1ES220	22
C1001	⚠	ECKDKC103PF	0.01

■ RESISTORS & CAPACITORS

Notes:

1. Part numbers are indicated on most mechanical parts. Please this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. The " **S** " mark is service standard parts and may differ from production parts.
4. Unless otherwise specified. All resistors are in OHMS (Ω), K = 1000Ω, M = 1000kΩ All capacitors are in MICROFARADS (μF) P = μμF

Numbering System of Resistor

Example

ERD	25	F	J	101
Type	Wattage (1/4W)	Shape	Tolerance	Value

50
Wattage (1/2W)

Resistor Type		Wattage		Tolerance	
ERD	: Carbon	12	: 1/2W	J	: ± 5%
ERQ	: Fuse Type Metal	25	: 1/4W		
		50	: 1/2W		

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001 F)	Tolerance	Peculiarity

ECEA	50	M	R47	R
Type	Voltage (50V)	Peculiarity use	Value (0.47 F)	Special use

Capacitor Type		Voltage				Tolerance	
		ECEA Type		Others			
ECEA	: Electrolytic	1A	: 10V	1H	: 50V DC	J	: ± 5%
ECCD	: Ceramic	1C	: 16V	2H	: 500V DC	K	: ± 10%
ECKD	: Ceramic	1E	: 25V	KC	: 400V DC	Z	: +80%, –20%
ECQM	: Polyester	1V	: 35V	05	: 50V DC	P	: +100%, –0%
ECQV	: TF	50	: 35V				
		25	: 25V				

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